Deep Space Optical Communication (DSOC)

Active Technology Project (2016 - 2023)

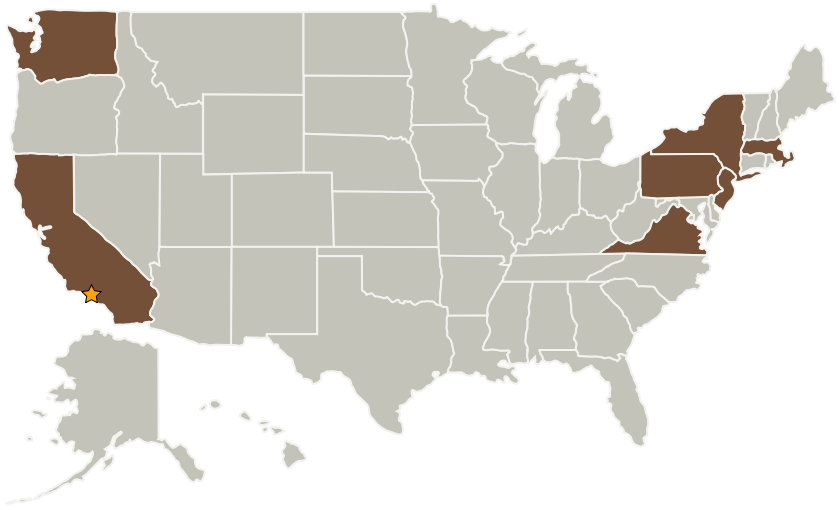
Project Introduction

The Deep Space Optical Communication (DSOC) project will develop and deploy a flight terminal and a ground network, which includes uplink and downlink terminals, and demonstrate a Deep Space Optical communications capability. Implementation of DSOC is part of the NASA SMD Psyche mission slated to launch in 2023. The DSOC mission will demonstrate at least a 10× enhanced data return capacity relative to state of the art deep-space telecommunication systems with equivalent mass and power. The demonstration will retire the risk of implementing an operational capability for future NASA missions throughout the solar system and pave the way toward novel light science applications.

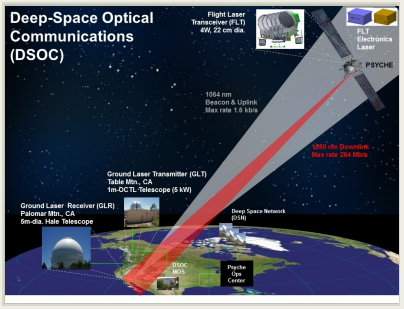
Anticipated Benefits

Enable streaming of high-definition video from deep-space. Support human exploration of deep-space. Enable use of high data rate science instruments. Facilitate novel light science applications. High precision ranging. Laser probing of atmospheres and plasmas.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California



The Deep Space Optical Communication (DSOC) device will beam high data rates to a telescope at Palomar Mountain, California.

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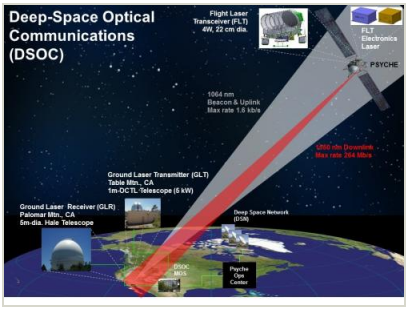
Co-Funding Partners	Type	Location
Space Communications and Navigation(SCaN)	NASA Program	
Space Technology Mission Directorate(STMD)	NASA Mission Directorate	

Primary U.S. Work Locations	
California	Massachusetts
New Jersey	New York
Pennsylvania	Virginia
Washington	

Images



Deep Space Optical Communication (DSOC).jpg
The Deep Space Optical Communication (DSOC) device will beam high data rates to a telescope at Palomar Mountain, California. *(https://techport.nasa.gov/image/100867)*

Project Website:

https://www.nasa.gov/mission_pages/tdm/main/index.html#.VQb6XUjJzyE

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Center / Facility:
Jet Propulsion Laboratory (JPL)

Responsible Program:
Technology Demonstration Missions

Project Management

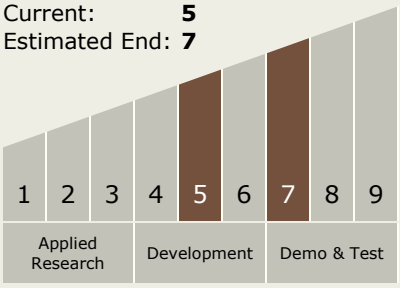
Program Director:
Trudy F Kortes

Program Manager:
Tawnya P Laughinghouse

Principal Investigator:
William M Klipstein

Technology Maturity (TRL)

Start: **5**
Current: **5**
Estimated End: **7**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.3 Lasers

Target Destinations

The Moon, Mars, Others Inside the Solar System

Supported Mission Type

Planned Mission (Pull)